DEPARTMENT OF INTERNAL MEDICINE AND DEPARTMENT OF BIOMEDICAL ENGINEERING  
COLLEGE OF MEDICINE AND COLLEGE OF ENGINEERING AND APPLIED SCIENCE  

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students  

APPLICATION DEADLINE: 04/26/2022  

PROJECT TITLE: Computer controlled micro-positioning system for ultrasound neurotherapies  

Physical Requirement : Work at a wet lab bench  
Project's Technical Skills Requirement : MATLAB and particularly instrument control  

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Project Description  

Our laboratory is collaborating with multiple laboratories in both the College of Medicine and College of Engineering and Applied Science to develop ultrasound-mediated blood-brain barrier opening to enable the delivery of therapeutics for the treatment of both neurodegenerative diseases and cancers. Our current system achieves these ends but requires manual positioning of the therapeutic ultrasound transducer. The manual positioning leads to less accurate treatments. This project will implement computer-controlled micro-positioning systems to automate the treatment process and make it more reliable. Instrument control will be performed using MATLAB. It is expected that the student will be highly experienced in MATLAB and preferably have demonstrated skills with instrument control. Ideally the developed software system would also integrate information from published murine brain atlases to facilitate the most accurate targeting of desired tissue. This project will provide the opportunity to interact with numerous other groups. Training in ultrasound therapies will be provided.